Communication Tools When Modern Methods Are Unavailable

Gloria Dalinda Rybinski

Highlands County Board of County Commissioners

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Table of Contents

Abstract

With the introduction of the Internet and social media, Public Information Officers (PIOs) have concentrated their studies and catered communication tactics to the preference and mediums utilized by their target audience. Electronic communications and social media have proven to be a fast and effective way to get information out to a large quantity of citizens, but what tools are available when power and Internet are unavailable? The objective of this research is to provide PIOs with tools that can be utilized in those instances. A survey was utilized to gauge other PIOS knowledge of tools that are not Internet and power dependent. The survey revealed that an estimated 67 percent of the PIOs surveyed were not aware of any tools to use when power and Internet were not available or limited. This shows a need to plan and have a robust list of resources to utilize under any circumstance, in order to have a successful communication plan.

Introduction

Modern communication methods, such as social media, have become an effective way to easily transmit vital information in emergency situations due to their widespread public utilization. In many cases these tools are the primary official means of mass communication for a given geographic region. However, these tools are power and Internet dependent. What does an organization do when power is out or the Internet is down? It is critical that PIOs have a robust back-up plan which includes a variety of non-Internet and non-energy dependent tools. These methods will become essential to effectively communicate necessary information when Internet and energy access are limited or unavailable.

Professional PIOs know how to use Twitter, Facebook, Instagram, Nextdoor, Everbridge and other platforms to get the message out. Most PIOs should also have a good relationship with the media and a healthy list of contact information for them, but what to do when social media platforms are down, and when the Internet is not working? This could mean 98% of the target population does not have power and access to the Internet. What if the radio stations antennas are on the ground, and they do not have a generator? How does the message get out when the TV stations can transmit, but the population that follows them does not have access to a television or if they do, they do not have electricity to watch it?

The goal of this paper is to provide other PIOs a comprehensive resource guide to use in events like the ones described above to help them achieve the goal to provide the right information to the right people at the right time, so they can make the right decision.

Literature Review

It is important for Public Information Officers to have a well laid out plan on how to respond to different emergencies and how to ensure the message gets to those that need it. “The planner’s ability to identify and analyze publics is the cornerstone of an effective integrated communication campaign. Both elements of this step – identification and analysis – are equally important. First, we need to address the right group of people, so as not to squander organizational resources or miss opportunities to interact with important publics. Second, we must carefully examine each public in order to develop a strategy to communicate effectively” (Smith, 2017).

The success of a communication plan lies in the PIO’s knowledge of the public he or she is directing the message to and the tools available not only to the information officer but also to the target population.

Finally, “a communication tactic is the visible element of a strategic plan. This is what people see and do: websites and news releases, tours and billboards, blogs and special events, and so much more. Tactics are also the element of the plan that can carry a hefty price tag, so planning and coordination are particularly important” (Smith, 2017). A communication plan with a robust tool box with communication tactics that fit plan A and plan B is a must for PIOs. Ronald D. Smith’s book gives us the foundation of what it is needed to have good communications tactics. This research will provide tools to add to the communication tactics that can be utilized when power and Internet are not available.

Method

Participants

Participants in this research included PIOs from around the Country, representatives from companies that provide equipment and/or technology that can assist in communicating information when power and Internet are limited or not available and members of the public.

Forty-three PIO's from different states participated in the survey (See Appendix A). Of the participants, 49% worked for a local government, 26% worked for a state agency and 26% worked for other entities. Interviews were conducted with PIOs from jurisdictions that have experienced the need to utilize alternative communication tools. Interviews were also conducted with representatives from companies dedicated to alternative communication mediums.

Materials

A survey was used to establish the different tools known to PIOs and to gauge their knowledge of tools aside from social media, power and Internet dependent mediums, as well as, to establish a list of resources used in these types of incidents. The survey included questions about job title, other demographics, and resources used during emergencies, when power and Internet are not available or have limited use.

Interviews were also conducted with PIOs that have experience with the use of alternative communication tools.

Additionally, interviews were conducted with representatives from different companies that manufacture or operate equipment and or software to assist in communicating when power and Internet are limited or not-available.

A four-question survey (See Appendix B) was also developed for members of the public to determine usable tools from the public point of view.

Procedures

A survey consisting of 16 questions was developed for PIOs from around the Country to answer. Aside from direct reach to fellow PIOs, the survey was made available to members of the National Information Officers Association and the Florida Association of PIOs.

Once the responses from the survey were received, interviews were conducted with specific Public Information Officers and representatives from multiple companies that distribute communication equipment and software.

Thirty-seven members of the public were surveyed during the Highlands County Hurricane Preparedness Expo to obtain additional usable tools/mediums.

Results

The response from the surveys was that 67 percent of the PIOs that responded were not aware of any other tools to use to communicate when power and Internet were not available or limited. Fourteen out of the forty-three information officers surveyed, were aware of the following tools:

Billboards: "A flat surface (panel, wall, or fence) on which bills are posted specifically: a large panel designed to carry outdoor advertising" (Billboard, 2019).

Variable, Changeable or Dynamic Message Signs: "Are devices which are used to display the messages, warning signals or information about specific events to the people commuting on roads" (Variable Message Signs, 2019).

Trapline: Use of traps (boards) situated in strategic locations familiar to those affected are used to provide incident-related information and to help measure the local response to the message and incident.

Aerial Advertising: A form of advertisement that uses manned aircrafts or drones to display advertising materials.

Amateur Radio: Hobby enjoyed by thousands that use radio frequencies above the AM band to the microwave region frequency to broadcast.

Flyers: Printed advertisement or informational piece generated with the intention to hand-deliver or make available to a large number of people.

First Responders Assistance (Boots on the ground): The use of personnel paid or volunteer already in the affected area to help disseminate the message.

Call Tree / Phone Tree: "A call tree is a layered hierarchical communication model used to notify specific individuals of an event -- typically unplanned in nature -- and coordinate recovery, if necessary. A call tree is also known as a phone tree, call list, phone chain, or text chain" (Rouse, 2019).

Radio: "The wireless transmission and reception of electric impulses or signals by means of electromagnetic waves. The use of these waves for the wireless transmission of electric impulses into which sound is converted" (Radio, 2019).

Discussion

Below you will find a compilation of resources, how to utilize them, and the approximate cost. These resources are the result of the survey and from further research of all known mediums that can be utilized during the events previously described.

It is important to note that, if available to the PIO, the traditional communication mediums delineated in their communication plan should be used in conjunction with the below listed medium to ensure maximum coverage.

Beforehand knowledge of the target population is a must. This will facilitate the decision-making process of selecting the medium, since the decision will be based on what will work best for the community and the resources that are readily available or have been previously coordinated for the specific area.

Out of Home Advertisement

Billboards.

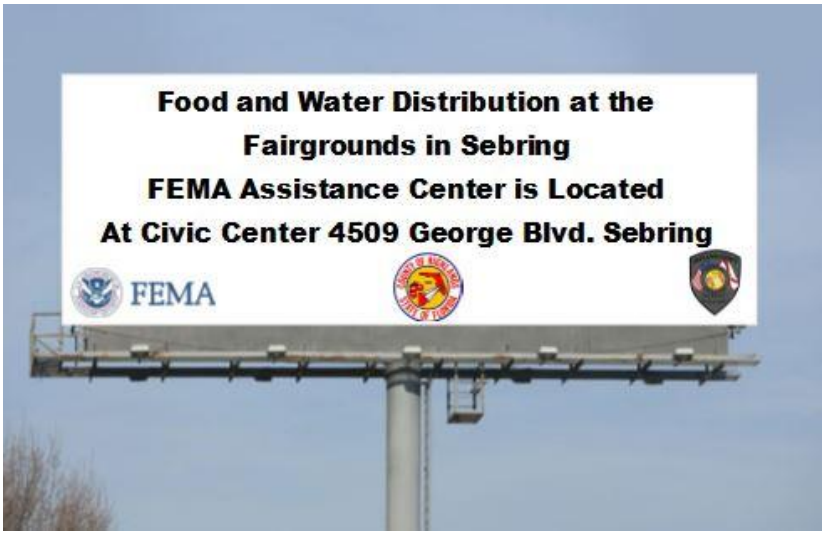

Figure 1, Billboard usage illustration, photo credit, Gloria Rybinski, Public Information Officer, Highlands County Board of County Commissioners.

Are a traditional advertisement medium that offers opportunities for commercial and noncommercial passage of information.

This medium has over 100 years of history going from advertising circus in a 9x6 poster in 1835, development of standards in the 1900s, to the introduction of digital billboards in 2005, which is the most current version of out-of-home advertisement.

In 1913 “public service advertisement became a common practice and was seen as a responsibility of the industry”. Messages on the boards ranged from inspirational to social concerns, including Adolph Treider’s war poster Have You Bought Your Bond? Which made history as the first government sponsored poster produced after the United States entered the war” (FOAA: Florida Outdoor Advertising Association, 2019).

Many billboards are now electronic and can be broken down into four types: Bulletins, the largest kind typically up to 14 feet high and 48 feet wide; Poster panels, smaller than bulleting but more efficient since they can be located in more areas; Transit shelter, located in bus, train/tram station and taxi stands; Mall posters, these are kiosks located at shopping centers.

Billboards provide an effective, accessible and cost-efficient way to communicate.

The use of Electronic Billboards as a communication medium can be a key tool for a PIO to provide information to the citizens of a community in an emergency where power and Internet are limited because of its fast, convenient and flexible nature. However, for this medium to work it is recommended that prior to any emergency an agreement is established between the government entity and the provider to ensure that the provider understand the scope of needs. Points to take into consideration are:

- Strategic location of billboards for better coverage will need to be determined. In order to accomplish this, the use of multiple companies may be needed
- In the process of selection of locations, it should also be ensured that selected boards will allow for onsite message upload.
- Due to the nature of the emergency the original sites selected may not be available therefore, it is important to have alternative sites identified.

- Although this medium is energy-dependent, it can be upgraded to utilize generator power. The arrangements for provision of generators and size needed will need to be included in prior agreement.

Another point of consideration is a public private partnership with local businesses that have smaller billboards, so they can also broadcast the message.

In June 2008, a nationwide program named Amber Alert Digital Billboard Program was developed in partnerships with Billboard operators to provide special messages such as Amber alerts. Also, in 2008, the Florida Department of Emergency Management entered into a partnership with the Florida Outdoor Advertising Association for displaying of alerts on digital billboards during emergencies (FOAA: Florida Outdoor Advertising Association, 2019).

The monthly cost for one billboard starts at approximately $1,000.00.

Mobile Electronic Advertisement (MVS).

Another form of out-of-home advertisement. This medium uses the sides of trailers or trucks to display the information while the vehicle is in motion or parked in strategic locations. This communication medium was introduced in 2008, and according to Outdoor Advertising Magazine, it has a 97% recall rate. (https://ialternativemedia.com/mobile-billboard-research/, 2019) MVS offers the advantage that it can deliver the message directly to the most affected or needed areas. As with the other billboards, is it imperative to have an agreement in place prior to an emergency to secure availability, also some logistic items may need to be addressed in the agreement such as fuel provision, type of file needed and predetermined target areas. If the nature of the emergency is due to a storm, roads may be impassable, so the use of this medium can be delayed.

The average cost to use one of the trucks is $1,500.00 for 8 hours. (considered a day of work) or approximately $200.00 per hour.

A different version of this option is a resource utilized mainly in Latin American countries. The vehicle is equipped with multiple speakers that can play a pre-recorded message or provide information live. The vehicles can travel around the community providing disaster information.

Bandit, Snipes, or Yard Signs.

Although, not permitted in many communities, these types of advertisements are the kind that are attached to utility poles or stuck to the ground and are smaller in size compared to other mediums. In case of emergency these signs can be placed at the entrance to populated communities and updated when information is available. In order accomplish this, the PIO will need to have the materials in stock prior to the emergency and have already identified potential target locations to get the most exposure. A plan for the distribution of updates will have to be established prior to facilitate the task.

The cost for this type of sign is approximately $3.65 each plus the cost to print and place flyers on signs.

Aerial Advertisement, Banner Planes.

The term Aerial Advertisement was introduced around 1947 by a Pilot named Milo Tichacek (Aerial Advertisement History, Airads Worldwide Since 1947, 2019).The key success factor of this form of advertisement is that it delivers the message outside of work or home in an environment where residents are more at ease.

People look at airplanes based on instincts and the message they carry can reach multiple communities in one single trip. The information can be designed to reach by area of interest, based on an economic factor or by geographical area. Aerial advertisement has a 79% recall rate (Aerial Advertisement, 2019). Although the recall rate for this type of advertisement is high, "Aerial advertising is effective if a large target audience is gathered near the source of advertising" (Smith, 2017).

The letters from a banner are 5 or 7 foot-high, with bigger letters allowing for better readability. However, this can lead to higher cost and a reduced size of the message. The use of standard prefabricated letters facilitates the delivery of messages with short notice and allows a quicker exchange of the message at the end of each flight.

There are different types of aerial advertisement such as Aerial Banners, Aerial Logo Banners, Aerial Billboards, Helicopter Displays, Night Signs, Airship-Blimp-Zeppelin, Skywriting, Search Light and Flower Droppings (Types of Aerial Advertising, 2019). In some areas, the distribution of flyers via drones or planes is available. The cost to use aerial advertisements will depend on the market in which you are located, and the type of advertisement selected. A prior agreement is recommended to ensure the availability of the service during an emergency.

Variable, Changeable or Dynamic Message Signs

Figure 2, Dynamic Message Sign used during a wildfire in Highlands County FL. photo credit Melissa Yunas, Wildfire Mitigation Specialist with the Florida Forest Service.

These types of signs, commonly known as electronic traffic signs, were first utilized in 1950. However, they gained popularity approximately 20 years ago. The main use for this type of sign is to provide roadway information such as closures, construction, Amber and Silver alerts etc.

The three-line by eight-character Portable Changeable Message Sign is the standard Department of Transportation sign sufficient for federal highways and anywhere else where there is enough room for their larger frame. There is also a growing popularity for a full matrix option of this sign. The full matrix option provides the ability to use the entire sign panel (full) and even create and use symbols and animations instead of just 3 lines that contain letters (characters) (Porter, 2019). There are different models available and messages can be pre-loaded to the system for easier setup.

Many entities already own this type of sign. PIOs can utilize these signs to provide short critical incident information. There are agencies with interlocal agreements already in place for the utilization of these type of sign to provide public awareness. In Florida, “A good example is the Smoke Management Interagency Agreement, a written agreement between Florida Forest

Service, Florida Highway Patrol and Department of Transportation for public awareness using digital signs (Yunas, 2019).

With the proper prior arrangements, the Information Officer can locate the signs in strategic areas to notify the public of important incident related information. It is important to take into consideration that depending on the type and magnitude of the emergency, those signs are going to be utilized for the purpose they were originally purchased and may not be available to the Information Officer. Due to availability issues, it is recommended to have rental agreements in place with a company that can deliver the signs to your area in a reasonable amount of time. The company selected should ensure the availability of resources or reservation of resources to your entity, since in many cases State agencies are given priority in emergencies depleting the resources available.

Price to purchase the signs ranges from approximately $11,000.00 to $15,000.00.

Trapline

Figure 3 Trapline used in California photo credit Melissa Yunas, Wildfire Mitigation Specialist with the Florida Forest Service

Figure 4 Campboard, photo courtesy of Joe Zwierzchowski, Wildfire Mitigation Specialist with the Florida Forest Service

Trapline will vary by incidents; what may work in one region may not be the most efficient way in another. Although they are referred to as a board at pre-established location,

traplines can also be improvised by utilizing a wall at a convenience store, a restaurant, a gas station, post office or libraries, etc., that are frequented by residents of the affected community. (Holt, 2007)

Traplines are used for external and internal communication (Camp Bulletin Board) for example, in large forest fires they are used to provide fire crews working the fire, information such as status of the fire, maps of the fire, demobilization information, rotation schedule for personnel working the incident, human resources information, resources available to them, photos of the incident, safety messages, action plan for the day, and newspapers (local and from different States if you have mutual aid from other areas). The type of information on the internal boards is not going to change much from one incident to another.

For external communication, the information provided is going to depend on the type of incident at hand. In general, it is good to include items such as evacuation maps, point of distributions locations, types of resources available for residents, situation reports, contact numbers for additional information, contact numbers for those that would like to volunteer (Holt, 2007).

This is an effective way to communicate, but it requires preparation. The boards need to be built prior to the incident and location of the boards need to be advertised prior to the event so that residents know where to go and get information. The resources to post on the boards will need to be on hand and the mechanism to update the boards should be established prior to the incident. If the PIO is going to rely on volunteers or first responders to update the bulletin boards, those relationships need to be established prior. In some jurisdictions, an interlocal agreement may be required, and it is a must to have delineated in writing the expectations from each of the participants.

The cost to build one trapline ranges from $ 100.00 to $ 500.00 each. The Public Information Officer should also have available white paper, color paper, a laminating machine and items to affix the information to be posted to the boards such as a staple gun, additional staples and tape.

Amateur Radio

Amateur radio, also called ham radio, has been around for over 100 years. This service brings together communications, electronics, and people from all walks of life. The use of ham radio is not limited to a town. Ham radio is used around the world, and it operates without the need of the Internet and cell phones. Ham radio also provides in many communities a free public service during times of disasters. In times of need, this form of communication can be a lifeline.

To be a ham radio operator, a person needs to have basic knowledge of the operating principles for radio and be familiar with radio technology. Operators need to be able to pass an examination to obtain a Federal Communications Commission License to operate the amateur bands which are frequencies reserved or allocated for use by ham radio operators.

> "It's easy for anyone to pick up a computer or smartphone, connect to the Internet and communicate, with no knowledge of how the devices function or connect to each other," said David Isgur, communications manager for the American Radio Relay League, the National Association for Amateur Radio. "But if there's an interruption of service or you're out of range of a cell tower, you have no way to communicate. Ham radio functions completely independent of the Internet or cell phone infrastructure, can interface with tablets or smartphones, and can be set up almost anywhere in minutes. That's the beauty of Amateur Radio during a communications outage.
>
> "Hams can literally throw a wire in a tree for an antenna, connect it to a battery-powered

> transmitter, and communicate halfway around the world," Isgur added. "Hams do this by using a layer of Earth's atmosphere as a sort of mirror for radio waves. In today's electronic do-it-yourself (DIY) environment, ham radio remains one of the best ways for people to learn about electronics, physics, meteorology, and numerous other scientific disciplines. In addition, amateur radio is a huge asset to any community during disasters or emergencies if the standard communication infrastructure goes down." (Amateur Radio "Field Dau" June 22 and 23 Demostrate Science, Skill, and Service , 2019)

With over 725,000 licensed ham operators in the United States (Amateur Radio "Field Dau" June 22 and 23 Demostrate Science, Skill, and Service , 2019), Public Information Officers can increase the reach of their message by utilizing this medium to provide information. Ham operators can broadcast emergency information to those that have access to this medium and those receivers, in turn, can disseminate the information to their families, neighbors and friends. During times of disaster, the use of this resource becomes a very important tool. It is imperative to develop relationships with the ham operators prior to any event. Many communities have already incorporated this use by allowing ham operator representatives to have a presence and defined role in the Emergency Operations Center.

The cost to have access to ham radio will vary depending on the agreement an entity will have with the operators. If the agency decides to have the equipment and operator inhouse, the cost will be higher than a private/public partnership with the operators from a particular community. The certification fee to operate ham radio is approximately $40.00, the most basic of equipment cost is approximately $200.00.

Call Tree / Phone Tree

A call tree or phone tree is a pre-arranged communication model that consist of layers or levels of contacts or connections where each member at a level of the tree is charged with passing the information to those in his/her tree and each subsequent level does the same. In simple terms, a phone tree is a system for contacting a large number of people quickly in which each person called, then telephones a number of other designated people.

Originally, this communication model was utilized by individuals placing telephone calls to those on their tree. With the evolution of technology, many software have been developed to improve this model of communication. In today's electronic era, this communication model is known as "call tree", "calling tree", "outbound IVR" (outbound interactive voice response system), or "smart auto dialer" to name a few. Mass notification applications are available to us currently that work very similar to this model but, with the ability to reach more members of a community. Some of the applications required individuals to sign up others are capable of pushing the information to the residents without the need to sign up for the services. Those applications, however, are energy and Internet dependent, which in situations when energy and Internet are not available, they may pose an issue. The good news is that those applications can relay the information to residential telephones which, if the citizens have a landline telephone that is corded they can still receive the message. Those with cellphones even when the Internet is not working can still receive text messages for the most part.

It is worth mentioning that in some cultures this way of communication is still the number one way to transfer information during emergency situations. Also, in the citizens survey conducted for this research, a high percentage of those that participated indicated that they will seek information from relatives, coworkers, employers and neighbors (Peguero, 2006). A PIO

can highly benefit from this communication model by utilizing the applications available, and by developing a traditional call / phone tree.

To establish a call/tree, the information officer needs to develop a list with telephone numbers of those that will serve as the first layer. It is recommended to have a better reach, that those in the top layer belong to organized groups that cover all parts of the community, such as Bar Association, Religious, Medical, Teacher, Agricultural Groups, Homeowners Associations, etc. It is important to note that if the target population is a diverse one, key members of those groups may be good members of this top layer.

The layers on the tree should be a manageable number of members. That number will be determined by the size of the information officer department or the number of volunteers that are recruited for this purpose. The cost to use a call/phone tree application will depend on the jurisdiction preference. Many States provide access to an application service free of charge. The only cost to enable the traditional phone / call tree is the upkeep of a database and the time spent for the coordination of the call / phone tree.

Before, during and after Hurricane Irma, the use of the application Everbridge was critical in the effort to provide information to the citizens of Highlands County, FL. In a period of 3 days, the Everbridge system (HCIrma) received close to 12,000 subscribers. The citizens were able to receive vital storm updates via this medium. During a public meeting as part of the after-action report efforts, the feedback received from the citizens was very positive, some expressing that the messages received via Everbridge kept them abreast of the situation and provided them with needed resource information.

Additionally, some communities have access to utilize the Integrated Public Alert & Warning System (IPAWS) which “provides public safety officials with an effective way to alert

and warn the public about serious emergencies using the Emergency Alert System (EAS), Wireless Emergency Alerts (WEA), the National Oceanic and Atmospheric Administration (NOAA) Weather Radio, and other public alerting systems from a single interface" (Integrated Public Alert & Warning System, 2019). The Wireless Emergency Alerts (WEA) is available to disseminate the following three types of information: alerts issued by the President, alerts involving imminent threats to safety or life and Amber Alerts. "The Emergency Alert System is a national public warning system that requires TV and radio broadcasters, cable television systems, wireless cable systems, satellite digital audio radio service providers, direct broadcast satellite service providers and wireline video service providers to offer to the President the communications capability to address the American public during a national emergency. The system also may be used by state and local authorities to deliver important emergency information such as AMBER (missing children) alerts and emergency weather information targeted to a specific area" (Emergency Alert System (EAS), 2019).

It is important to also provide information to services such as 2 1 1 to facilitate the dissemination of information.

First Responders Assistance (Boots on the ground)

Sheriff Deputies, Police Officers, and members from all branches of law enforcement along with Firefighters, Emergency Medical personnel, and volunteer groups are the perfect medium to get information out to the public during an event when power and Internet are not available. Since they are in the heart of the community, they tend to those in need and the citizens reach out to them for information.

If equipped with the correct information and a plan for distribution, the personnel that are already in the center of the incident will be the most appropriate to help with the dissemination

of information. Those that are in the community and respected by the citizens are the perfect medium to transmit information. An idea for the use of this medium is, if the emergency event requires evacuations with officers or national guard personnel stationed at strategic locations to prevent re-entry, the PIO needs to provide those working at the road block point with daily facts sheets / updates and talking points, plus a call center phone number and a list of places where citizens can go for follow-up information, since the public comes to them for questions.

Additionally, patrol vehicles, fire trucks and ambulances are already equipped with a public address system (PA) that can facilitate the process of information dissemination.

PIOs will need an agreement in place with the different entities that delineates the expected participations of other departments during a disaster. Public Information Officers will also have to ensure that the “boots on the ground” have the latest information available. This can be accomplished by ensuring that every upcoming shift has a printout of the latest situational report. In order to accomplish this, the timing of the release of information may need to be changed to accommodate shift changes.

The cost to implement this information medium is hard to estimate since the main expense will be in-kind services. The other expense is the cost to print the materials to be distributed, which will vary based on the size of the target population and the available resources in the department. Depending on these variables, this medium can be done in house or it may need to be outsourced.

Flyers

This form of advertisement, that is intended for wide distribution can be of assistance when power and Internet are an issue. To be able to get this solution to work, the PIO should have a good understanding of who the audience is and the quantity of residents in the area. This information is needed to determine the amount and type of flyers needed. Once that amount is established the PIO can determine if the printing can be done in-house or if it will require outsourcing.

If the printing is to be done in-house, the information officer should ensure to have available, a high capacity printer or copier, a generator to power it and a computer. It is recommended to have a backup in case of malfunctions. It is also recommended to have at all times plenty of supplies, such as paper, toner/ink to print the previously established number of flyers for a minimum period of 15 days.

Regardless of the who is going to be printing the flyers due to the circumstances for which the flyers are needed, it is recommended for PIOs to have a template and format designed prior to any emergency to facilitate and expedite the process.

If the printing is going to done by a third party, an agreement should be in place prior to any emergency, where it delineates the time expectation for the print jobs and the way they are to receive the information to be printed. This agreement should also establish the expectations for self-sufficiency, or if the entity is to provide generator power.

Once the way the flyers are to be printed is established, it is time to think about distribution. Depending on the size of the community, flyers can be distributed via traplines, posted on official bulletin boards, handed out in public places with high traffic, affixed to power poles and any previously established distribution place or a location where residents gather. It is

important to note that during times of emergency, locations that regularly have high traffic of citizens due to the incident may not have any traffic of residents also depending on the type of emergency the most adequate locations may change.

The cost to produce the flyers will depend on the amount to be printed and the method used. The cost to distribute the flyers will be for the most part in-kind services from other entities and volunteer work.

Radio

Radio communication is the result of the mix of two other inventions, the telephone and the telegraph. Nikola Tesla was the first person to take out a patent for wireless radio transmitters. “From about 1920 to 1945, radio developed into the first electronic mass medium, monopolizing “the airwaves” and defining, along with newspapers, magazines, and motion pictures, an entire generation of mass culture” (Radio Definition, History, & Facts Britanica.com, 2019).

“Radio is a leading reach platform since 93% of the population listen to the radio. More than 243 million Americans adults with a diverse background listen to the radio every month” (Radio Facts and Figures | News Generation | Broadcast Media Relations, 2019).

According to the Pew Research Center, “traditional AM/FM radio…continues to reach the overwhelming majority of the American public audio as a platform is stronger than ever as more and more ways to listen continue to emerge.” News/talk/information stations are one of the most popular broadcast radio formats, with an 9.6% share of listener among the age 12 and up demographic in 2017. That is second only to top contemporary hit radio at 8.1%. Online radio

listenership in cars has drastically increased to 40% of U.S. cellphone owners listening in 2017 (Radio Facts and Figures | News Generation | Broadcast Media Relations, 2019).

"AM/FM radio is America's top reach medium, giving it mass appeal among diverse audiences—across generations, ethnicities and demographics. By generation, radio has the largest reach with Generation X (ages 35-54), with 80.5 million listeners tuning in during an average month (97% of the Gen X population). This is followed by Millennials (18-34-year-old), with 71.6 million listeners tuning in monthly (95% of the Millennial population). Meanwhile, radio reaches 41.2 million monthly listeners among Baby Boomers (ages 55-64), representing 98% of the Baby Boomer population" (How America Listens: The American Audio Landscape -- Nielsen, 2019).

After Hurricane Irma and Harvey, radio played a very important role in communications.

"For some stations, there was no precedent for what happened on air during the hurricanes. "We'd never done anything like this," says **Sarah Frazier**, senior vp and market manager for CBS Radio Houston, who directed the simulcast of KHMX and CBS' other stations during Harvey. "We just knew time was of the essence because if you're evacuating, you can't search for a street to get out on, you just have to get out. We made that our focus."

Radio groups followed a similar strategy in Florida. "We broadcast non-stop, with state officials, the mayor, sheriff and the spokesperson for Florida Power & Light [on the air]," says **Jesus Salas**, executive vp of programming for Spanish Broadcasting System's Miami and Key West stations. Across the state, Cox Media Group station coverage also featured local officials. "News 104.5 WOKV's presence is so strong in Jacksonville that emergency managers and power company leaders were calling in with updates," says

> **Steve Smith**, Cox's vp of radio programming.
>
> In Tampa, Beasley Broadcast Group's stations opened their phones for listeners. "Some just wanted to thank neighbors for helping and say how grateful they were to have survived," says Beasley operations manager **Tee Gentry**.
>
> At iHeartMedia stations, nationally syndicated morning hosts **Kane** and **Elvis Duran** joined the coverage in Tampa and Miami. Duran and Miami-based show cast member **Froggy** spent the weekend at WHYI (Y100)'s studios, where they did Monday morning's show. Duran also was part of the team on News-Talk WIOD. "Riding out the storm, spending the night with a hundred dedicated colleagues, was an honor," Duran says. "What mattered most was being a companion to listeners, again proving the unique value of live sound content over all other forms of media." (During Hurricanes Harvey and Irma, Radio Stations Help Communities Weather the Storm, 2019)

A partnership with a local radio station will help tremendously with message distribution. This partnership agreement may include items such as understanding of the infrastructure and steps taken by the radio station to ensure ability to broadcast during pre-determined incidents, amount of broadcast to be done, frequency of appearances, form of transmission (weather updates are going to be done in person, pre-recorded or via telephone). These steps are especially important for those information officers that work for small areas and do not have a back-up person, since in the event that too many interviews a day are scheduled the PIO may not have enough time to prepared. If a Joint Information System / Center (JIS/JIC) is activated the radio interviews can be delegated to a specific PIO. It is important to schedule dissemination of information at pre-determined times so citizens know when to tune-in to receive updates, and maximize battery life of their device.

National Oceanic and Atmospheric Administration (NOAA) Radios

AM / FM radios are a standard feature on personal vehicles. One of the most recommended tools for an emergency preparedness kit is a battery-powered or hand-crank radio and a NOAA Weather Radio with tone alert. AM / FM radios are available for sale with integrated NOAA radio alerts, and it is recommended that information officers continue to promote the importance of having a battery operated or hand-crank AM / FM and NOAA radio, so citizens can receive information from local authorities.

> "Having a NOAA Weather Radio in your home and workplace could save your life. Weather radios are designed to broadcast special frequencies and alert owners of hazards. The weather radio you buy can be set to silent until a warning of your choice occurs, at which point, it will alert you.
>
> You cannot rely on television programs to warn you of an approaching tornado when the power is out. Only a weather radio, which is equipped with a backup battery, is only the truly fool-proof way to get your severe weather warnings. Even city-wide tornado sirens are fallible, tornadoes have been known to tear down siren alert systems in their paths.
>
> NOAA Weather Radio All Hazards transmitters broadcast on one of seven VHF frequencies from 162.400 MHz to 162.550 MHz. The broadcasts cannot be heard on a simple AM/FM radio receiver. There are many receiver options, however, ranging from handheld portable units which just pick up Weather Radio broadcasts, to desktop and console models which receive Weather Radio as well as other broadcasts.
>
> You can purchase a basic weather radio for as little as $20. They are sold at most electronics stores, including Radio Shack and Amazon.com" (Weather Radio / Weather Underground, 2019).

> Why it is important to rely on radios during storms and emergencies? This question is especially important in time when cellular technology exceed what radio can do, but the answer is simple: radio travels way farther than an LTE broadcast. That makes it much easier to get a signal and reaching as many people as possible is the first priority with emergency broadcasts. (Why do we rely on radios during storms and emergencies? - The Verge, 2019)

Internet and Power Access

Another option when power and Internet are out is to provide Internet access and the opportunity for residents affected to charge their equipment. In times where citizens of a community are so dependent of the Internet and energy, it is time to think outside the box and make it possible for those in need to have continued access to these services, so they can communicate with relatives outside the affected area and have some sense of normalcy while facilitating the PIOs job by providing a centralized location to access those uncommunicated. Provisions for these types of services will also require all the contacts and agreements to be made prior to any incident. Some government buildings may have generators and Internet access. However, the Internet issue that may be affecting the community may also be affecting that entity and public access Wi-Fi may not be available since the bandwidth will be dedicated for the entity operation and public safety efforts

There are many companies that provide mobile satellite Internet services. Their services range from smaller systems to provide services to a handful of equipment to more elaborate trucks/trailers that provide services to more complex systems. They mainly market to provide services to Federal, State and local governments for continuation of operations. However, the same technology can be and has been used to provide services to citizens at a set location.

It is worth noting that the price for this type of service ranges, depending on the plan selected and whether the equipment is rented or purchased. Although FEMA owns several of this type of equipment to assist government entities, reimbursement for citizen (public) use is not available.

The major wireless service providers also have similar services called mobile communication trailers, which provide free phone calls, Internet access, and recharging services to residents without power. Contacts with those in a position to deploy this service will have to be established prior to ensure availability, especially if your community is a small one since the number of these trailer is limited and larger communities may get priority.

Conclusion

Modern communication methods, such as social media, have become an effective way to easily transmit vital information in emergency situations due to their widespread public adoption. Moreover, in many cases these tools are the primary, official means of mass communications for a given geographic region. Therefore, it is critical that PIOs have a robust back-up plan which includes a variety of non-Internet and non-energy dependent tools. These methods will become essential to effectively communicate necessary information when Internet and energy access are limited or unavailable.

As evidenced by the survey conducted, many PIOs are not aware of alternative ways of communications or what some call the “traditional” or “old way of doing things”, Also the citizens survey showed that citizens are not aware of other ways of getting official information when power or Internet are not available.

It is imperative for PIOs to have a good knowledge of their target population and to have an emergency communications plan that includes tools to be utilized when power and Internet

are not available. This plan should include a check list (See Appendix C) of tools to be utilized and a list of contacts and agreements in place to utilize the tools. The use of modern communications medium in conjunction with those tools provided in this research will offer the PIO more opportunities to get emergency messages out to the citizens so they can make the right decision.

There are several alternatives to utilize when power and Internet go down. Most of the items discussed in this research are common sense but the PIO must plan for these mediums. Additionally, the citizens must be educated before an incident, so they can also be better prepared.

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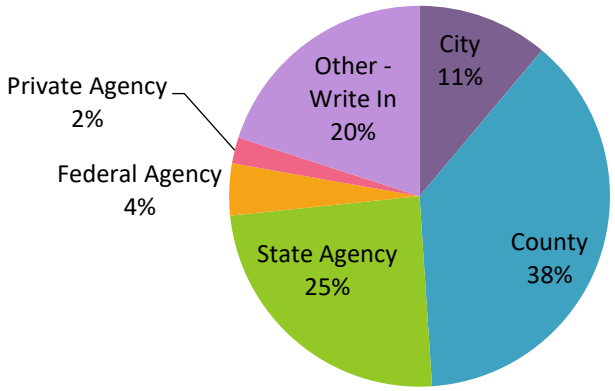
Appendix A

Public Information Officer's Survey

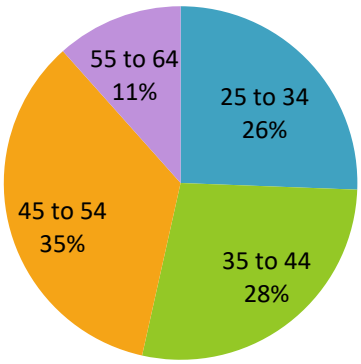
APPENDIX A, PUBLIC INFORMATION OFFICER'S SURVEY

Report for PIO Research

1.Are you a PIO (or related title) for a:



2.What is your age range?

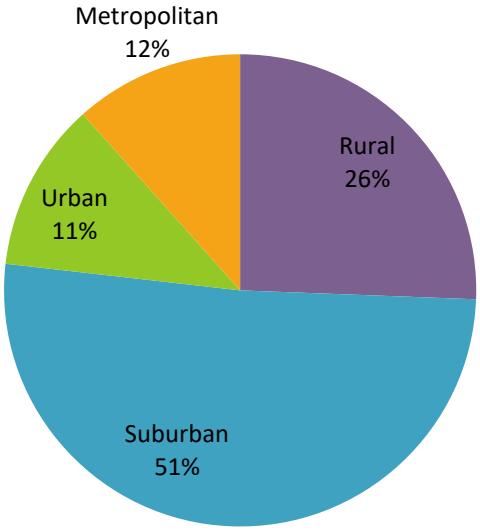


3.How many years of experience do you have in this field?

Years of Service	Responses
1 to 5	4
6- to 10	7
11- to 15	4
16- to 20	3
21 to 25	2
26 to 30	1
Over 30	3

APPENDIX A, PUBLIC INFORMATION OFFICER'S SURVEY

4.How would you describe your target area?



5.Median age of your target population?

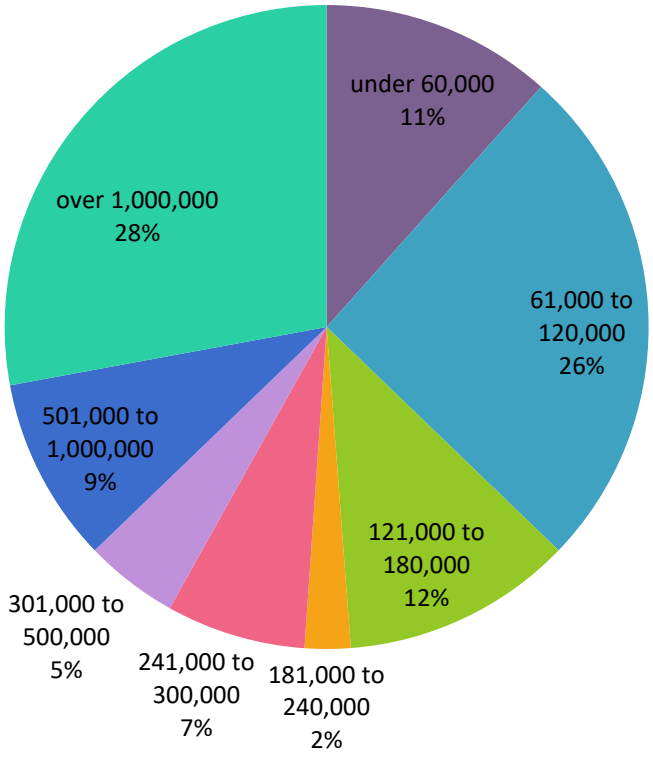
Write In
100
45
35
40
50
55
38
18-45
18-65
18-75
25
25-50

29.2
30
34
35-44
37-40
55+
62
65
All ages. Statewide- rural, urban and suburban
Unknown
Unsure
unk

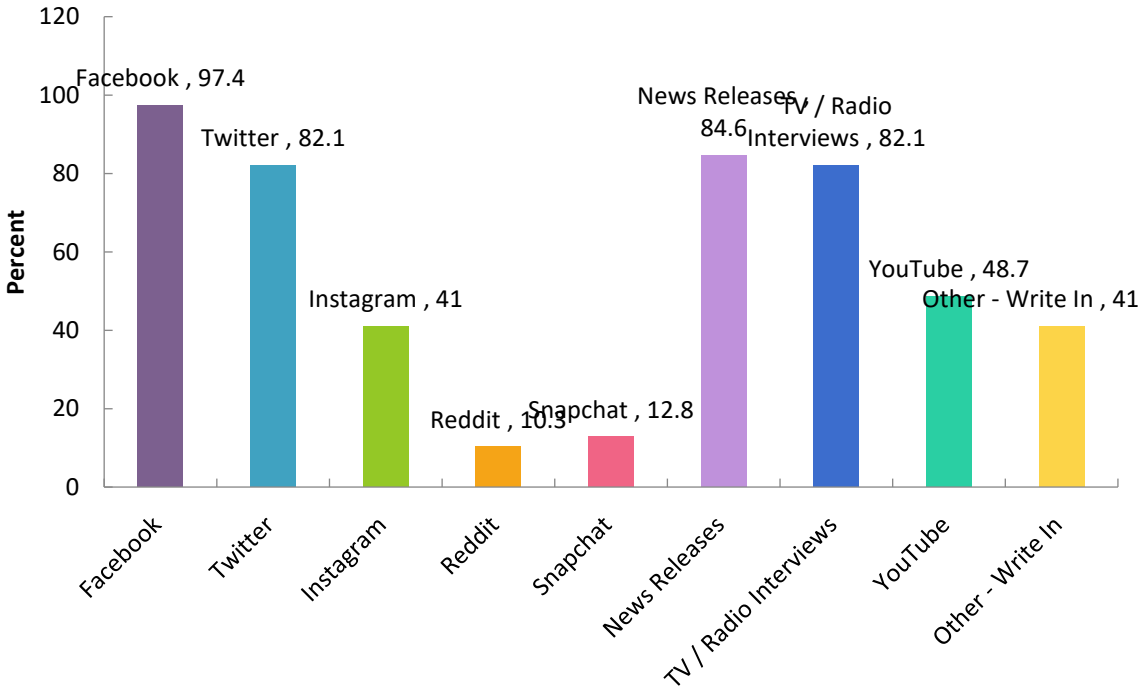
6.Number of employees in your organization?

Number Range	Responses
Less than 100	8
101 to 400	10
401 to 800	3
801 to 1200	1
1201 to 1600	1
1601 to 2000	1
Over 2000	3

7.What is the population of your target area?



8.Primary communication methods / tools: (choose all that apply)



Other - Write In
Anaheim Alert (Everbridge)
Blogs and IPAWS
City facilities, senior centers, etc
Flyers distributed by hand to airport common places, as well as to airport tenant and charter operators.
Next Door
NextDoor
NextDoor - we have 20,000 followers on NextDoor
Nextdoor
Opt in emergency notifcation system
Reverse 911, IPAWS (Emergency Alert Systems, including Wireless)
Website
Websites / town meetings/ public speaking
direct mail e-newsletter
peg channels
podcasts, Nextdoor, website
radio and email distribution lists

9.What tools do you use to translate to other languages?

Write In
none
Google
we dont
Coordinate with HQ on language support in blue sky; disaster contracts in an emergency
Google or professional
Google translate, when we do, which is not often because we have a very low ESL population.
Human translation
Human translators.
Language Line contractual service
Local Embassy Offices
N/A
NA
None

APPENDIX A, PUBLIC INFORMATION OFFICER'S SURVEY

Phone extensions
Professional translation service, certified translators in the agency
Professional translators, Language Line telephone, web-based translation services
Staff interpreter- Spanish and ASL interpreters
Staffed interpreters
Telephone service
Translator and interpreter on state contract, state employees who are certified deaf interpreters, and some bilingual staff members who can correct text from Google translate
Translators
University of Denver for certified language translation, Google Translate if in a pinch.
We don't translate everything. However, we have two three news shows in different languages that are produced by our CityTV channel. If we send out educational materials, we will sometimes have them translated into Spanish. We need to do more of this admittedly.
bilingual employees
built in translation on website

employees
google
google translate. We also have a bi-lingual employee who assists when able in emergency situations
human translator, google translate
n/a
staff translated
volunteers
volunteers
Totals

10.How do you communicate with tourist or transient population?

Response
In the same manner as we do our community.
There isn't a solid plan in place to communicate with transient population aside from various newsletters in workplace settings.
Emergency alerting system, DOT billboards
Partnerships with Chambers, Tourist Councils, Nixle, Informational Handouts
Social Media or TV
Nothing specific
Primarily social media.
Partnerships with tourism agencies, local chambers of commerce, hotel TV channels, billboards, over-the-road signage, brochures at interstate welcome centers, publications for free in local stores, public events on holidays, paid advertising with tourist-oriented businesses (peddle cabs, amusement attractions, water parks, etc.)
IPAWS We also have contact with consulates from various countries and can communicate to foreign nationals that way.
N/A
Social Media and local chambers of cimmerce
Coordinate with local news media to push information, reach out to hotels and tourist boards, chambers of commerce, and other agencies (such as DOT)to share information broadly and cast a wide net. We have also used billboards, NextDoor (and social media broadly), and proactive interviews to share information.
We have a robust communication network with the operators of our resort area venues. Visitors are encouraged to follow the City and Police and Fire Departments on social media and to subscribe to Anaheim Alerts while they are in town
Work with our county's Office of Public Affairs as needed.

Our tourism bureau has outreach efforts in place.
Established relationships with commerce industry, tourism industry, municipalities and media
same as listed in #9
Primarily social media. We have large concentration of transient student pilots and charter jet passengers. Social media has been our best bet to move the needle. Important to note: we are a general aviation airport with NO COMMERCIAL AIRLINES.
nothing different
IPaws
vacation rental companies, visitors bureau
Facebook, news outlets, interstate reader boards
Social media, and local television/radio
Facebook, common knowledge
Social Media is our main source of public communication. As a county we coordinate with what the city has established and assist where they need gaps to be filled.
Radio
Radio/TV. social media. Website
TV News and social media primarily.
Ipaws.
Facebook, Twitter and local media

11.How do you accommodate the visually impaired and hard of hearing?

Response
We appeal to support groups. For example, a hearing center in town to let them know about our specialty fire alarms.
We have TTR/TTY opportunities, as well as traditional media. We find that these audiences use adapted technologies to help them receive messaging from traditional outlets.
TTY telephone lines, alt text, closed captioning
We use ASL interpreters and captioning for videos and press conferences.
Unknown
Web tools, closed caption
Arkansas School for the Blind/Deaf when it is needed.
We have a cadre of ASL interpreters with availability 24 hours a day. Blind people can usually hear so we make sure all visuals have an audio component as well as making sure our social media and online content is accessible to screen readers.
Certified deaf interpreters who can sign for emergency information videos. We put captions on all videos we make. Most blind members of our community can still understand a spoken message.
We haven't.
We have a dedicated DAFN Coordinator
Primarily incorporating accessibility into our product development, including press releases and closed captioning for videos. Work with HQ on interpreters as available for press conferences and meetings.

Visually impaired - Voice messages Hearing impaired - Closed captioning
We are deficient in this area. We make our print materials available in alternative formats. We close caption our videos. We run accessibility checks on our web content. We also contract with sign language interpreters when needed.
Our TV broadcasts and Facebook live videos are all closed-captioned. We have had someone using ASL to sign at press conferences, but not every time.
Subtitles on videos, Federal government documents
We do not have a standard operating procedure. We do work with dispatch and the clerk's office if a request is made.
Efforts are made by tenants and charter companies to identify and accommodate those clients/passengers with visual or hearing impairments. As far as the airport authority, we work closely with local and county public information resources to reach this demographic when needed and in the event of an emergency.
closed captioning and ADA screen reader compliance
n/a
working on this.
Close captioning, alt tags, hearing devices at public meetings
N/A
Unfortunately, we have no certain way to push the message to this population
As a county and as the emergency management division we coordinate with what the city has established and assist where they need gaps to be filled. We also have relationships with the resources offered through the TRI County Health services and resources.
Radio
ASL interpreters at news conferences Accessible websites

We use an ASL interpreter for press conferences. This is an area where we need improvement.
Not at all
A sign language interpretor during press conferences. We need to work on this area.

12.What is your go-to tool to communicate during an emergency when power and Internet are not available or limited? Why?

Response
To be honest, we have never experience this, and need to be more prepared if something like this were to happen.
MIFI; battery backups (UPS); generators; cell phones. Readily available and accessible.
Emergency alerting system, door-to-door visits, community newsletters
Printed flyers or other handouts. You can have first responders or other workers hand out or place at community centers.
Face to face patrolling. Signage at a designated information site.
Ham radio, police & fire driving through neighborhoods with bullhorns
Radio if it's an option, word of mouth if not. We have 77 local offices of emergency management in our 75 counties. If I can get the word to those guys/gals or to the "boots on the ground" folks then they are my best tool to communicate with the public.
Traditional broadcast media, AM radio, HAM Radio and the LP1 stations in a given market- we pay for them to have back up generators and fuel. We have a Amateur radio network throughout the state, in the county EOCs and hospitals. NOAA weather radio because most have back up power. We also have a message courier plan in place with all counties identifying a central place to post printed materials, like a county courthouse or town hall. These are all options that we planned for and have actually had to use in real world incidents.
We will likely use route alerting (Public address systems on public safety vehicles) and a trap line (posting emergency information updates at community gathering points like schools and churches). Dropping flyers from aircraft is also a possibility. In Puerto Rico they used route alerting using tumba cocos (google them)

No plan for this.
Social Media is our go to.
Still in development - our Region has communication capabilities, but are still exploring how to reach people who have lost power / Internet. In the past, we have used flyers, community billboards and message boards, and even first responder vehicle drivebys. However, we have not had to do this in our Region in a long time.
Face to Face contact and voice announcements via PA system form the ground and helicopter
Print materials, door hangars, texting and face-to-face.
We have not been in that situation, however our plan is paper (and pen, if printers not available) and drive messages out to gathering places.
Members of patrol units, religious and faith-based organizations, community and recreation shelters, school district
Local radio station, HAMM operators, first responders, community emergency response team
On-airport, for aircraft and aircraft operators, we use air traffic control and ground frequency radios, also aeronautical radios (ARINC) For staff, we use a dedicated 800 MHz frequency to coordinate with local fire and law enforcement. We also have our emergency alert system, EVERBRIDGE. Those with cell service can receive messaging. In addition, we will send staff to each fixed base operator (private terminal) location with information. The FBOs will then alert their passengers and tenants.
radio
Local Store
printed communications through fire departments since they are throughout the county in various communities and that's where people tend to go in these types of situations.
variable message boards (on generator) hand outs/flyers broadcast radio
Local radio stations. Dispatch updates delivered directly to local fire stations and law enforcement on patrol.
N/A

We use our resources with radios in vehicles to notify, we use our HAM radio groups, as well as foot patrol. In our area, flooding and tornadoes are our spring disasters.
Radio, easy to have battery operated receivers.
We still use social media during post storm power outages- never had a complete loss of cellular networks- even during our largest hurricanes Have used flyers at low tech option Route alerting also works for neighborhood notification
We experience this during a hurricane several years ago, and found that social media, along with boots on the ground, was our best approach. Local TV stations continued to broadcast on Facebook and many residents were still using their phones to get news. They would charge phones in their vehicles. My agency also set up charging stations for phones to help residents be able to keep getting info that way.
Social media
Facebook. People with cellphone access use that as their primary means of receiving information in situations such as this. During one event when this happened, a local TV news station broadcast entirely from Facebook Live.

13.What other tools or communications medium are you aware of, that would work to get your message out during an event when Internet and power are not available or limited?

Response
Hamm radios, but have not pinpointed operators in our city.
We have researched a few portable power options, but haven't acquired any of the tools.
Not sure
Variable message boards Banner planes Police loudspeakers NWS messaging over radio
Unknown
?

This is a good question. I can't wait to see the other responses to it.
Air drops with supplies and information. Community emergency response team members relaying information. Door-to-door safety checks by local responders. Public meetings.
Getting mobile Carriers deployed quickly to the area would be helpful, because they can bring vehicles that support cellular communications. Google COLTs and COWs. Cell on light truck and cell on wheels. Fortunately, electricity is one of the more resilient utilities, so in our state, we would expect it to be restored more quickly than other utilities in a major earthquake. The military also has some really awesome technology that can support emergency communications in areas that don't have functioning telecom infrastructure. I just can't remember what unit it is from the army right now
Posting fliers.
Swift Reach
Flyers, billboards, community message boards, DOT message boards on roads; blimp messages; airplane or helicopters; HAM / ARES radio; sirens; newspapers.
Trap lines
Ham radio
We also have HAM radio operators as part of our EOC.
Word of mouth, foot patrol
We have messengers in each of the unincorporated communities that would help push out messaging. We would use the local radio stations to coordinate. We also would use another community's capabilities to push Internet-dependent messaging.
In dire emergencies, the air traffic control tower uses a hand-held, battery-operated light gun to communicate with aircraft. It is also used to communicate with aircraft that have lost communications. Aircraft will acknowledge the light signals by "rocking" their wings or acknowledging with their landing lights, if available. We have also explored a system of colored flags to communicate with the ground population about certain operational conditions. Nothing solid yet.
boots on the ground

N/A
roaming fire trucks, law enforcement and HHS staff distributing info.
traplines/signs banner planes amplification device (bullhorn, loudspeaker) from LEO vehicle
Vehicle-mounted loudspeakers (i.e. fire engines, law enforcement patrol cars).
N/A
Posters and creating designated locations for information. Safety officers patrolling and getting the word out of locations and immediate danger.
Radio.
See previous response
Old fashioned methods, such as central message boards where fliers and bulletins can be found, police bullhorns and occasionally knocking on doors.
social, local news
boots on ground, fliers, stationary message boards

14.Feedback / Comments:

Response
Very interested in this subject. We have experienced tornadoes and other severe weather that could cause us to encounter such hardships in communicating. Would like to see the alternatives and be able to incorporate them into our emergency action plan.
Our audience is rural, suburban, and urban
Good luck! Let me know if I can be of further assistance. Brooke 850 630 5804

I look forward to learning from your results.
Interesting topic! May want to look into how PIOs can function after an EMP with a complete and total failure of the electric grid.
Feel free to contact me if you have any specific questions Joe Dougherty Public information officer Utah Division of Emergency Management JDougherty@utah.gov
Good luck on your project!
I look forward to reading your paper. Hugs from Alaska, Brenda
best of luck with your paper
I plan to slowly build a supply of traplines (enough for each fire department) and will paint them bright orange and place them in front of the stations before an anticipated Cat 3 or higher storm to let people know that this is where they can find info post-storm, then put them up for the storm and bring them out after the winds pass.

Appendix B

Citizens Survey

Citizens Survey Responses

1) **Age range:**

18-24 (4 responses)	25-34 (3 responses)	35-44 (6 responses)
45-54 (4 responses)	55-64 (4 Responses)	65 and up (6 responses)

2) **During an emergency such as a Hurricane when there is no power or access to the Internet, how do you plan on getting emergency information?**

   Hand crank radio (3 responses), Battery Radio (6 responses), Phone car charged, Radio (5 responses), Use my app Everbridge, Storm Radio, Cellphone text, Radio Station, Phone, Community, HCSO App., Charger, Via emergency weather radio, Emergency Operations Center AM /FM Radio, Weather Alert Radio, Socialize with community, local Law Enforcement.

3) **How do you prefer to get the information?**

   On my phone, Text (2 responses), Phone Online, Internet (2 responses), Internet, phone, Radio, Text / EOC, Tv. Internet, Via Satellite Phone, Text Internet / Websites Electronically, Phone Library, Internet / Application, Text / Social Media, Internet or Tv, Cellphone Internet, Online / Internet, Online and text Cellphone, Pamphlet dropped from Black Hawks Internet, radio if no power, Internet / Social Media

4) **If you had to go somewhere to get the information where would you go?**

   EOC (3 responses), Sheriff Office (3 responses) Police Department (6 responses, Community Center, City hall, Downtown, Ag Center, Work / Co-workers, Town Hall, Sun N Lake, County Government Center (2 responses), Friends house, Health Department (2 responses), City Hall (2 responses), Family, Emergency Shelter (2 responses), Fire Station, Library (2 responses), Internet, County facilities.

Appendix C

Emergency Communication Tactics Checklist

Emergency Communication Tactics

Tools that can be utilized when power and Internet are not available.

Billboards
- ☐ Location list
- ☐ Contract
- ☐ Energy needs

Mobile Electronic Advertisement (MVS)
- ☐ Contract
- ☐ Maps of potential target areas

Bandit, Snipes or Yard Signs
- ☐ Blank signs inventory
- ☐ List of target locations
- ☐ Contact list of personnel to post updates
- ☐ Supplies to update signs

Aerial Advertisement, Banner Planes
- ☐ Contract
- ☐ Pre-scripted message bank

Variable, Changeable or Dynamic Message Signs
- ☐ Interlocal agreement with other entities
- ☐ Rental agreement
- ☐ Location list
- ☐ Pre-scripted message bank

Trapline
- ☐ Location list
- ☐ Posting materials
- ☐ Posting tools
- ☐ Contact list of personnel to post updates

Amateur Radio
- ☐ Contact list of volunteers
- ☐ Channels to provide information to operators

Call Tree / Phone Tree
- ☐ Application login information
- ☐ List of top layer contacts
- ☐ Channels to provide information to operators

First Responders Assistance (Boots on the ground)
- ☐ Interlocal agreement with other entities
- ☐ List of volunteers
- ☐ Quantity of flyer to be printed
- ☐ Shift change schedule
- ☐ Materials

Flyers
- ☐ Printing tools
- ☐ Printing materials
- ☐ Contract with third party
- ☐ Interlocal agreement with other entities
- ☐ List of volunteers for distribution

Radio
- ☐ List of stations participating
- ☐ Contact information
- ☐ Energy needs / fuel needs
- ☐ Channels to provide information to stations
- ☐ Volunteer list

Internet and Power Access
- ☐ Cellphone providers contact information
- ☐ List of facilities within the area that can provide the service
- ☐ Contract with satellite internet services
- ☐ List of potential location for this service